Rocky Mountain Analytical Laboratory

April 30, 1984

Patrick A. Lincoln
Total Petroleum, Inc.
P.O. Box 500
Denver, Colorado 80201

Dear Mr. Lincoln:

I enjoyed our conversation on April 25, 1984 concerning the identification of the organic material in your water samples. Based on the analytical capability available at Rocky Mountain Analytical Laboratory (RMAL), I have prepared the following proposal to aid in the identification of the organic material contributing to the total organic carbon (TOC) measurements.

In view of the fact that the water has been analyzed for priority pollutants already without any significant organics found, it appears that the organic compound or compounds present are not amenable to the routine purge and trap (volatile) techniques or solvent extraction methods at basic and acidic pH (base/neutral/acid extractables) commonly used.

To cover the possibility that the compound is very water soluble and does not purge well, we propose directly injecting the water sample into a gas chromatograph/mass spectrometer (GC/MS) equipped with a column for separating compounds in the volatility range from ethanol up to xylene. The detection limit for this method is approximately 1 mg/l depending on the specific compound. The cost for this analysis is $150/sample.

Another possible explanation for the failure to detect the unknown compound in the priority pollutant runs is that it is pH sensitive and decomposes under the strong acid and base conditions used in the extraction for the base/neutral/acid priority pollutants. Therefore, we propose doing an extraction at neutral pH, followed by analysis on a GC/MS equipped with a fused silica capillary column. These columns are extremely inert and allow the separation of compounds in the volatility range from xylene up to the polynuclear aromatic hydrocarbons. The limitation is that very high molecular weight compounds (polymers) and compounds of very low volatility will not be detected. Detection limits are in the 10 to 100 ug/l range depending on the specific compound. The cost for this analysis is $335/sample.

After discussing the problem with various members of the staff at RMAL, I have concluded that the closed loop stripping method mentioned to you during our meeting would not provide significant new information about the sample that could not be obtained through the methods described above, particularly at the 1-50 mg/l level (TOC results).

Turnaround time for completion of this work would be 3 weeks.

Please call me if you have any questions or need additional information.

Sincerely,

Michael P. Phillips

Michael P. Phillips, Ph.D.
Manager
Industrial Organic Chemistry

MPP/crc